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EXAMINER	
COMAS, YAHVEH	
ART UNIT	PAPER NUMBER
2834	

DATE MAILED: 08/27/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/083,188	TOBA, AKIO	
	Examiner	Art Unit	
	Yahveh Comas	2834	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-22 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-12 is/are rejected.

7)☒ Claim(s) 13-22 is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The applicant recites the following limitation; "a stator having a coil wound around an end portion of a rail-shaped magnetic substance", which let unclear if the coil is wound around the stator, the stator end portion, or "an end portion". Also the phrase "relatively moves along the rail-shaped portion, and includes a magnetic substance" and "centrally produce magnetic flux on the rail-shaped portion" let the claim vague and indefinite because doesn't state relative to what the mover is moving and centrally to what produce the magnetic flux.

3. Claim 2 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claim doesn't state around what the coil is located. Also is unclear what makes a periodic magnetic change, the flowing of current and how the first component produces different distributions of magnetic changes of the plurality of pieces.

4. Claim 3-22 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding to claim 3 is indefinite if the projections on the stator pieces are facing the magnetic poles or not. Examiner suggests use the term "facing" after the word "piece" (page 43, lines 7).

Regarding to claim 5 is indefinite what applicant means by the phase "one to one" (page 44, line 15).

Regarding to claim 6-9, the applicant recites the following limitation; "the core of a strong magnetic substance with permanent magnet as a magnetic poles", which let unclear if the substance is magnetically strong or if the structure of said magnetic substance is the strong one.

5. The claims 1 –22 are generally narrative and indefinite, failing to conform to current U.S. practice. They appear to be a literal translation into English from a foreign document and are replete with grammatical and idiomatic errors.

Claim Objections

6. Claim 1 and 2 are objected to because of the following informalities:

- The term periodical in claim 2 should be periodic.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claim 1is rejected under 35 U.S.C. 102(b) as being anticipated by Inasumi JP 62104470A.

Referring to claim 1, Inasumi discloses a stator having a coil wound (14a and 14b) around an end portion of a rail- shaped magnetic substance (13), and a mover (2) which faces a rail-shaped portion (13) of said stator, relatively moves along the rail–shaped portion, and includes a magnetic substance, wherein an electric current flows through the coil (14) to centrally produce magnetic flux on the rail shaped portion facing said stator, thereby obtaining magnetic thrust of said mover (2).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nihei et al. U.S. Patent No. 4,945,268 in view of Maeda et al. U.S. Patent No. 4,860,183.

Nihei disclose a first component (1) which is formed by rail-shaped magnetic pieces (48), each of which coil wound (6 and 17) around at an end portion of a of the piece and makes a periodical magnetic change along the piece by flowing an electric current through the coil, and a second component (3) facing said first component (1) at predetermined spacing, and having N and S magnetic poles, where in said second component can be moved relative to said first component of said first component by differentiating distribution of magnetic changes of the plurality of pieces of said first component on a surface facing said second component. Also the coil wound (6 and 17) is wound perpendicular to the movement of the mover (3) and the stator teeth.

However, Nihei doesn't disclose the wound coil at end of the longitudinal direction of the pieces and a second component along the longitudinal direction.

Maeda discloses a planar linear pulse motor with a coil (32) wound around at an end portion of a longitudinal direction creating a linear pulse motor with reduced thickness. The stator is arrange in such way that a longitudinal direction is provided for the second component (5) relative to the coil, or perpendicular movement relative to the coils for the first component (1).

Therefore, it would have been obvious to one having skill in the art at the time the invention was made to modify Nihei's invention and provide a linear motor with a wound coil at the end portion of the longitudinal direction of the pieces and a second component facing said first component along the longitudinal direction of the plurality of pieces since this would have been desirable to create a linear pulse motor with a compact overall construction and size.

5. Claim 3, 6, 9 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nihei et al. U.S. Patent No. 4,945,268 in view of Miwa et al. U.S. Patent No. 4,594,520.

Nihei discloses a linear motor comprising a comprising a stator having two stator pieces pairs (1), and each stator piece pair is composed of two stator pieces (11 and 15) which are parallel-placed rail-shaped magnetic substance having a plurality of projections arranged at a regular spacing T in a longitudinal direction, a bridge made by magnetic substance connecting one end of each stator pieces together magnetically, and a coil wound (6 and 17) around the bridge to magnetize the two stator pieces for opposite polarities, and a mover having a magnetic core and magnetic poles formed on a portion of the magnetic core facing to said stator having a mover (3) piece comprising a magnetic core and a magnetic pole formed on a portion of the

magnetic core facing to said stator piece and arranges such that all or part of the N poles faces to projections of the stator when all or part of the S poles face to slots between the projections, wherein in each of two sets of one stator piece pair (11 and 15) and one mover piece (3) facing to each other, two sets of a stator piece and a mover piece facing to each other are arranged such that position to the projections on the stator pieces are sequentially shifted relative to those of the other set by T/2 in the longitudinal direction of said stator (1). The positions of the magnetic poles on the mover pieces (3) to the projections of magnetic poles on the mover pieces (3) to the projection on the stator pieces (11 and 15) are sequentially shifted relative to each other at a regular spacing along the longitudinal direction of said stator (1), and a thrust along the longitudinal direction of said stator can be produced on said mover by sequentially applying an electric current to a coil of each stator piece pair in a time series

However, Nihei doesn't disclose that the mover piece pair is composed of two mover pieces which are faced at predetermined spacing to said two stator pieces one to one which comprise said stator piece pair.

Miwa disclose a coil (47 and 48) wound around at an end portion of a longitudinal direction and the use of a mover (62) with a two set of teeth facing each stator piece (37-40) side of the stator for the purpose of providing a linear motor which can be smaller and suitable for various terminal equipments. The stator piece pair and one mover piece pair facing each other are arranged such that position to the projections on the stator pieces are sequentially shifted relative to those of the other set by T/2.

Therefore, it would have been obvious to one having skill in the art at the time the invention was made to modify Nihei's invention since was know in the art that provide a mover

with a two set of teeth facing each stator piece for the purpose of provide a linear motor which can be smaller sized and suitable for various terminal equipments.

6. Claim 4, 7 and 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over, Nihei et al. U.S. Patent No. 4,945,268, and Miwa et al. U.S. Patent No. 4,594,520, as applied in claim 3, and in further view of Kanazawa et al. JP Patent No. 02246762 A.

Nihei, as modify above, disclose the claimed invention except for the stator piece pair is formed such that the projections of its two stator pieces face to each other and said mover piece pair is provided between the two stator pieces in the stator pieces pair corresponding to the mover piece pair. However Kanazawa disclose a linear motor comprising a the stator piece pair is formed such that the projections of its two stator pieces face to each other and said mover (1) is provided between the two stator pieces in the stator pieces pair corresponding to the mover (1) for the purpose of improve servo characteristic (thrust/weight ratio) in a linear motor (for example fig. 1).

Therefore, it would have been obvious to one having skill in the art at the time the invention was made to modify Nihei's invention and provide a linear motor comprising a the stator piece pair is formed such that the projections of its two stator pieces face to each other and said mover piece pair is provided between the two stator pieces in the stator pieces pair corresponding to the mover piece pair for the purpose of improve servo characteristic (thrust/weight ratio) in a linear motor.

7. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ota JP Patent No. 62107667 A, in view of Onodera U.S. Patent No. 4,504,750.

Ota disclose a stator having three stator pieces (21a, 21b and 21c), each of which is formed by rail-shaped magnetic substance having a plurality of projections (22) arranged at a regular spacing, and which are arranged parallel to each other, with one end of the stator pieces magnetically connected, and with a coil (3a, 3b and 3c) situated in each of the stator pieces to magnetize the projections, and a mover (4), which are faced at a predetermined spacing to said stator piece one to one, and has a magnetic core and magnetic poles formed on a portion of the magnetic core facing to said stator piece and arranged such that all or part face the projections of the stator piece. Also, Ota disclose that the movement of the mover can be perpendicular to the stator pieces or can move in the same direction of the stator, and the teeth of said pole pieces are in the mover (4) direction and the thrust of said stator (2) can be produced on said mover (4) by sequentially applying an electric current to a coil of each stator piece in a time series.

However, Ota doesn't disclose a mover having M mover pieces, which are faced at predetermined spacing to said stator pieces one to one, and each mover piece has a magnetic core, which is magnetically connected to the core adjacent mover piece.

Onodera discloses a linear motor comprising a pair of iron cores with plural magnetic teeth in which phase is shifted 180 degrees in the direction of the movement and a mover (5) in which a group of magnetic teeth on the same iron core have the same phases. The mover have three mover pieces (511-513 and 521-523), which are faced at predetermined spacing to said stator pieces one to one, and each mover piece has a magnetic core, which is magnetically-connected to the core of the adjacent mover piece, and magnetic poles are formed on a portion of the core facing to said stator (4) and arranged such that all or part of the N poles face (511-513) to projections of the stator piece when all or part of the S poles face (521-523) to slots between

the projection, wherein with three sets of one stator piece and one mover piece facing to each other, the position of the magnetic poles on the mover piece to the projections on the stator pieces are sequentially shifted relative to each other at regular spacing along the longitudinal direction of said stator for the purpose of provide a linear motor with high efficiency, high performance and a large thrust force.

Therefore, it would have been obvious to one having skill in the art at the time the invention was made to modify Ota's invention and provide a mover having three mover pieces, which are faced at predetermined spacing to said stator pieces one to one, and each mover piece has a magnetic core, which is magnetically-connected to the core of the adjacent mover piece, and magnetic poles formed on a portion of the core facing to said stator and arranged such that all or part of the N poles face to projections of the stator piece when all or part of the S poles face to slots between the projection, where in with 3 sets of one stator piece and one mover piece facing to each other, the position of the magnetic poles on the mover piece to the projections on the stator pieces are sequentially shifted relative to each other at regular spacing along the longitudinal direction of said stator, per Onodera, for the purpose of provide a linear motor with high efficiency, high performance and a large thrust force.

8. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ota JP Patent No. 62107667 A, Onodera U.S. Patent No. 4,504,750, and in further view of Nihei et al. U.S. Patent No. 4,945,268.

Ota and Onodera substantially disclose the claimed invention but don't teach a mover piece that is configured by closely coupling a core of a strong magnetic substance with a permanent magnet as a magnetic pole.

However, Nihei discloses the use a strong magnetic substance (3) with a permanent magnet as a magnetic pole for the purpose of providing a permanent magnet linear (4 and 5) motor which is able to cancel the magnetic pull force generated between the stator and the mover, vibration and high-speed movement.

Therefore, it would have been obvious to one having skill in the art at the time the invention was made to modify Ota and Onodera and provide a mover piece that is configured by closely coupling a core of a strong magnetic substance with a permanent magnet as a magnetic pole per Nihei for the purpose of providing a permanent magnet linear motor which is able to cancel the magnetic pull force generated between the stator and the mover, vibration and high speed movement.

Allowable Subject Matter

9. Claim 13-22 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: The prior art cited (Nihei, Maeda, Miwa, Kanazawa, Ota and Onodera), in combination or along, teach the claimed invention except for the use a sensor coil wounded in a slot between the projections of said stator pieces, and an absolute position of said mover can be detected based on a change of inductance of the sensor coil made when said mover passes over the sensor coil.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yahveh Comas whose telephone number is (703) 305-3419. The examiner can normally be reached on M - F 8:00am - 4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nestor Ramirez can be reached on (703) 308-1371. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

YC

BURTON S. MULLINS
PRIMARY EXAMINER